

Hemel en Dampkring. Den Haag. 4 Jaarg. Juni 1906.

Smits, P. J. Bijdrage tot de kennis van den regenval in Nederlandsch-Indië. Pp. 23-29.

Società Meteorologica Italiana. Bollettino Bimensuale. Torino. Anno 1906. Serie 2. Vol. 25. N. 5-6.

— *Lo statoscopio. Pp. 38-40.*

LANTERN SLIDES FOR LECTURES.

We have received from Prof. H. J. Cox, of Chicago, Ill., an early copy of a pamphlet published by the Geographic Society of Chicago, and entitled "Lantern Slides for Illustration in the Study and Teaching of Meteorology", a subject to which we have already alluded in the MONTHLY WEATHER REVIEW, 1905, Vol. XXXIII, pp. 61, 255, and 444, and whose importance is very strongly urged in the article by Prof. J. P. Goode, printed on another page of this REVIEW. The pamphlet by the Geographic Society gives a detailed list of the slides offered, about 270 in all.

METEOROLOGY IN AUSTRALIA.

According to the Daily Telegraph, of Sydney, N. S. W., the third and last session of the Second Commonwealth Parliament was opened at Melbourne, with the usual ceremonies, on Thursday, June 7. In his opening speech to the Senate and House of Representatives, the Governor-General enumerated a series of subjects upon which Parliament would be asked to take action, and among these we find the following:

You will be invited to consider a bill for establishing a meteorological department and authorizing agreements with the states for work of this character hitherto undertaken by them.

These few words, taken in connection with the article by Mr. Andrew Noble, in the MONTHLY WEATHER REVIEW for November, 1905, Volume XXXIII, pages 480-484, show that there is some prospect of the eventual realization of a general federal weather bureau. A bill to this end was in the course of preparation in August, 1905, and was introduced by Senator Keating at the session of the Senate immediately following the above-mentioned opening address of the Governor-General, so it is likely that it will now be taken up and considered by the Australian Parliament.—C. A.

THE ENERGY OF A STORM.

By T. D. SMITH, M. D. Dated Louisville, Ky., February 6, 1906.

There has lately occurred to me a thought that seems to account for the energy employed in perpetuating the cyclone after it has once been inaugurated. It may be assumed that the momentum of the upward moving currents in the center of a cyclone carries the atmosphere in that situation far above the common level; that is, it produces a mountain of atmosphere in such situations, largely upheld by the momentum of the incoming air at the base of the cyclone. The top of this mountain is continuously pulled off and carried onward by the upper or anti-trades, if it be near the Tropics, or by the constant easterly current if it be in the temperate zones. This decapitated mountain, hollowed out at its base as it is, as regards its gravity, by the momentum of the upward moving core, constitutes a vast "low" into which the air around is continuously pressed. While this continuous decapitation is taking place by the upper currents the cyclone is made to lean in the direction of such upper current. This leaning gives to the mass of atmosphere drawn into it, or rather forced into it from in front, an advantage over the mass coming in from the rear; that is, it can reach any given point on the front of the cyclone sooner than the mass from behind can reach the corresponding point; and this in turn will cause a reforming of the center continuously in advance, which will carry the cyclone with it. Thus, the upper currents of the atmosphere, deriving their motion from the rotation of the earth, in turn furnish the motive force for the cyclone, and the energy derived from precipitation and latent heat might be largely or altogether dispensed with.

AERO CLUBS AND METEOROLOGY.

Our readers have no doubt noticed the formation of several aero clubs. The members are apparently wealthy gentlemen who propose to develop the art of navigating the air. Kites, balloons, aeroplanes, and other apparatus will be used. The records of voyages made in balloons, and the various observations made by the members of these clubs, will interest meteorologists, as contributing somewhat to our knowledge of the atmosphere. The simple record of direction of motion of a free balloon and its speed, as measured upon a map, is of itself a very great addition to our knowledge of the movements of the air. As is well known, no anemometer gives anything more than the relative movements for a very restricted locality; on the other hand cloud movements are sometimes quite illusory, because they represent only a locus of condensation, and we may have stationary clouds with a gale of wind blowing through them. Consequently every balloon voyage that is faithfully charted, whether it be a pilot balloon, a manned balloon, or a sounding balloon, is a record, and at present the only record we have, of the absolute movement of free air over a long path.

In December, 1871, the Editor presented to the Philosophical Society of Washington the results of a study of a large number of balloon voyages made by Prof. Samuel A. King, the well-known aeronaut of Philadelphia. These were made before daily weather maps were accessible, but at least one important generalization appeared, namely, that as the balloon rose higher and higher it kept moving in a direction that almost always deviated more and more to the right of the movement of the lowest wind. From that time forward balloon voyages, as reported in the daily newspapers, were regularly entered upon the manuscript daily maps used by the Editor in the forecast work.

During the past ten years an increasing interest has been shown in balloon work from a meteorological point of view; and now the establishment of aero clubs throughout the United States can not but be helpful to our science, no matter whether the voyagers work from the point of view of the practical aeronaut, the enthusiastic faddist, the wealthy pleasure seeker, the ingenious inventor, or the intelligent investigator. We therefore hope that each of the aero clubs established in this country will kindly contribute records of its voyages, very much as shown in the following list sent us by the Aero Club of America.

ASCENSIONS MADE BY MEMBERS OF THE AERO CLUB OF AMERICA FROM FORMATION OF CLUB TO DATE.

Dated 753 Fifth Avenue, New York, N. Y., July 28, 1906.

[Communicated by Mr. E. L. JONES for Mr. Augustus Post.]

Sunday, February 11, 1906.—Balloon "Alouette"; 350 cubic meters capacity; coal gas used; pilot and passengers, Charles Levee; ballast taken, 68.04 kilograms; ascent made at West Point, N. Y., 3:55 p. m.; descent at Hurley, 5 miles west of Kingston, N. Y., 8:10 p. m.; manner of landing, rip cord; elapsed time, 4 hours and 15 minutes; distance, 59.545 kilometers; speed per hour, 14.01 kilometers; general direction, north; highest altitude, 1000 meters; barometer at start, 30.6; lifting power of the gas, 233.15 kilograms.

On account of the wind, inflation consumed considerable time. Wind on the ground was from the north. After ascending, the balloon struck a current of air from the south, carrying it over the Hudson River toward Storm King Mountain; then traveled in a northwesterly direction over the Catskill Mountains; a further change brought it back in an easterly direction to Hurley.

Washington's Birthday, February 22, 1906.—Balloon "Alouette"; 350 cubic meters capacity; coal gas used; pilot and passengers, Charles Levee; ballast taken, 9 kilograms; ballast used, 9 kilograms; ascent at Hillburn, N. Y., 5:44 p. m.; descent at Ramsey, N. J., 6:10 p. m.; elapsed time, 25 minutes; distance in kilometers, 8:05; speed per hour, 19.32 kilometers; general direction, south; highest altitude, 500 meters.

Gas very poor, with little ascensional force. Balloon was followed by automobile which arrived about the time of descent. Rip cord used in landing.

Saturday, March 10, 1906.—Balloon "Alouette"; 350 cubic meters capacity; coal gas; pilot and passengers, Charles Levee; ascent at Pittsfield, Mass.

Balloon "Aero Club, No. 1"; 345 cubic meters capacity; coal gas used; pilot and passenger, Leo Stevens; ascent at Pittsfield, Mass.

Inflation was delayed, by lack of facilities, until late in the afternoon. The wind increased, and it was decided to fasten the half deflated balloons and wait until the following day. Shortly after 9 o'clock in the evening the envelopes broke away from the nets and sand bags. Mr. Stevens's balloon escaped. Mr. Levee's balloon was ripped open by contact with an iron stake. The watchman said the "Aero Club, No. 1" rose to a great height and sailed away to the east.

Saturday, March 31, 1906.—Balloon "L'Indies"; capacity, 530 cubic meters; coal gas used; pilot and passengers, Count de la Vaulx and Charles Levee; ascent at West Point, N. Y., 4:45 p. m.; descent at Peekskill, N. Y., 5:15 p. m.; elapsed time, 30 minutes; distance, 11.27 kilometers; speed per hour, 22.53 kilometers; general direction, southeast; highest altitude, 400 meters; rip cord used in landing; 30 kilograms of ballast taken, 20 used.

High wind prevented early start. The balloon pursued a direct course across the Hudson River.

Monday, April 2, 1906.—Balloon "Orient"; capacity, 1000 cubic meters; coal gas used; pilot and passengers, Count de la Vaulx, Charles Levee, and Dr. Julian P. Thomas; ballast taken, 52.61 kilograms; ascent made at One hundred and thirty-eighth street, New York City; descent at Glendale, Long Island, N. Y.; time of ascent, 5:10 p. m.; time of descent 6 p. m.; elapsed time, 50 minutes; distance, 11.27 kilometers; speed per hour, 13.52 kilometers; general direction, southeast; highest altitude, 1000 meters; thermometer at start, 10° C.; rip cord used; 100 kilograms ballast taken; 55 kilograms used.

Balloon crossed the East River in its course.

Tuesday, April 3, 1906.—Balloon owned by L. Capazzay, of Belgium; capacity, about 595 cubic meters; coal gas used; pilot and passenger, Paul Nocquet; ballast taken, 127.01 kilograms; ballast used, 54.43 kilograms; ascent at One hundred and thirty-eighth street, New York City, about 5 p. m.; descent at Jones Beach, Long Island, N. Y., about 9 p. m.; rip cord used in landing; elapsed time, 4 hours; distance 45.06 kilometers; speed per hour, 11.265 kilometers; general direction, southeast; highest altitude, about 610 meters.

This trip ended in the death of Mr. Nocquet. The balloon pursued an irregular course across Long Island. The landing was evidently perfect. No one seems to have seen the balloon during the latter part of its journey. From the marks in the sand, made by the edge of the basket, and by the guide rope, it was concluded that the balloon had been driven out to sea, and, after striking a countercurrent of air or on account of change of wind, retraced part of its course in a northerly direction until it came to the beach again, when the descent was made. The balloon was found deflated and everything arranged in order. No instruments were carried. The body was found on a small island between Jones Beach and the mainland of Long Island, a village on the shore of which he was probably attempting to reach on account of the lights of the village (Amityville) being plainly visible from where he landed, not knowing that a multitude of small islands, creeks, and open spaces of water separated Jones Beach from the mainland of Long Island. The lights of life saving stations on either side of where he landed, a short distance away, were not visible to him on account of the sand hills. The balloon was found on the beach by the half-hourly patrol about 9 o'clock, or a little later.

His death is attributed either to exhaustion from his efforts in crossing the creeks, etc., by wading and swimming, or to failure of heart action due to unknown causes. A monument will mark the spot of his unfortunate death.

Wednesday, April 11, 1906.—Balloon "Orient"; capacity, 1000 cubic meters; coal gas used; pilot and passengers, Charles Levee, Dr. Julian P. Thomas, Mrs. Dr. Thomas; ascent at Pittsfield, Mass., 3:30 p. m.; descent at Somers, Conn., 6:00 p. m.; elapsed time, 2 hours and 30 minutes; distance, 90.12 kilometers; speed per hour, 36.05 kilometers; general direction, southeast; highest altitude, 1524 meters; valve used in landing; 100 kilograms ballast taken, all used.

Saturday, April 14, 1906.—Balloon "Centaur"; capacity, 1200 cubic meters; coal gas; pilot and passengers, Count de la Vaulx, Homer W. Hedge, Alan R. Hawley, Augustus Post; ascent at Pittsfield, Mass.

After the balloon was inflated the wind appeared to be strong and the ascension was indefinitely postponed. Balloon deflated at 2:15 p. m.

Wednesday, April 18, 1906.—Balloon "Centaur"; capacity, 1200 cubic meters; coal gas; pilot and passengers, Count de la Vaulx, A. M. Herring, Alan R. Hawley, Augustus Post; ballast taken, 181.44 kilograms; ballast used, 136.08 kilograms; ascent at Pittsfield, Mass., 12:34 p. m.; descent at North Colbrook, Conn., 2:21 p. m.; rip cord used in landing; elapsed time, 1 hour and 47 minutes; distance, 51.50 kilometers; speed per hour, 28.09 kilometers; general direction, southeast; highest altitude in meters, 2004; thermometer at start, 20° C., at finish, 18° C., at height of 2000 meters, 4° C.

Ascension very successful. A sudden drop of 1524 kilometers in five minutes occurred. Landing was rough in a 28-kilometer wind which dragged the car about fifty meters, owing to unfastening of neck cord.

Saturday, April 28, 1906.—Balloon "Centaur"; capacity, 1200 cubic meters; coal gas; pilot and passengers, Count de la Vaulx, Homer W. Hedge, Charles Jerome Edwards; ballast taken, 226.80 kilograms; ascent at Pittsfield, Mass.; descent at Waterville, Conn., near Torrington, about 6 p. m.; distance, 96.56 kilometers; general direction, south, bearing east.

Saturday, May 12, 1906.—Balloon "Initial"; capacity, 1000 cubic meters; coal gas used; pilot and passengers, Charles Levee, Alfred N. Chandler, Henry S. Gratz; ascent made at Point Breeze, Philadelphia, Pa., at 1:15 p. m.; descent near South Amboy, N. J., at 3:50 p. m.; rip cord used in landing; elapsed time, 1 hour and 35 minutes; distance, 107.83 kilometers; speed per hour, 68.07 kilometers; general direction, north-east; highest altitude, 1100 meters.

High wind at start. Balloon traveled some of the time at fifty miles an hour. Mr. Post followed in automobile as far as Trenton, N. J., but it was impossible to keep up with the balloon. From Trenton, the balloon was followed by telephone.

Tuesday, May 15, 1906.—Balloon "Stevens"; capacity, 623 cubic meters; coal gas used; pilot and passenger, Leo Stevens and Tracy Tisdell; ballast taken, 23.68 kilograms and 27.22 kilograms of photographic apparatus, including 4000 feet of film; ballast used, 22.68 kilograms; ascent at One hundred and thirty-eighth street, New York City, at 1:20 p. m.; descent at Alpine, N. J., at 4 p. m.; elapsed time, 2 hours and 40 minutes; distance, 16.09 kilometers; speed per hour, 6.03 kilometers; general direction, north; highest altitude, 731 meters.

Balloon contained heavy load of moving picture apparatus (kinetograph) in addition to ballast. In passing over the Hudson River the gas suddenly cooled and the balloon quickly dropped¹, hitting the Palisades below Alpine, opposite Hastings. The envelope was torn in falling down the mountain side, and balloon and occupants were dragged in the river. Machine for taking pictures was dropped on the rocks and broken. All the films were saved. Pictures were taken up to the very moment of striking the hill. Parties uninjured, being rescued by a man in a launch.

Monday, May 21, 1906.—Balloon "Nirvana"; capacity, 1500 cubic meters; coal gas used; occupants, Charles Levee and Dr. Julian P. Thomas; ballast taken, 635.04 kilograms; ascent at One hundred and thirty-eighth street, New York City, 4:45 p. m.; descent at Peekskill, N. Y., 8:30 p. m.; elapsed time, 3 hours and 45 minutes; distance, 57.94 kilometers; speed per hour, 15.45 kilometers; general direction, north.

The gas contained considerable water which leaked down from the envelope.² Balloon traveled southeast over Long Island, dropped into a lower current and came back westerly, crossing the Hudson River near Yonkers, N. Y., thence northwest over the Ramapo Mountains nearly as far as Orange County; then easterly again over the Hudson toward Croton; then north to point of descent.

Saturday, May 26, 1906.—Balloon "Initial"; capacity, 1000 cubic meters; coal gas used; occupants, Charles Levee, Frederic C. Unger, Mr. Tuttle; ascent at Point Breeze, Philadelphia, Pa., at 2:35 p. m.; descent near Newton, Pa., 3:45 p. m.; rip cord used in landing; elapsed time, 1 hour and 10 minutes; distance, 48.28 kilometers; speed per hour, 41.37 kilometers; general direction, northerly; highest altitude, 1800 meters.

Sunday, June 17, 1906.—Balloon "Nirvana"; capacity, 1500 cubic meters; coal gas used; occupants, Charles Levee, Dr. Julian P. Thomas; ballast taken, 816.48 kilograms; ballast used, 775.66 kilograms; ascent at One hundred and thirty-eighth street, New York City, 5:50 p. m.; descent at Butternut, 8 miles from New South Berlin, near Utica, N. Y., 8:20 a. m., 18th; rip cord used in landing; elapsed time, 14 hours and 30 minutes; distance, 241.40 kilometers; speed per hour, 16.65 kilometers; general direction, northwesterly; highest altitude, 2438 meters.

Immediately at the start the balloon went into the clouds, the weather being rainy and stormy, and passed over the Hudson River without seeing it; came down below cloud near Little Falls, N. J., and sent message home; went into the clouds again and above them. At 9 p. m. a very severe storm came up, the lightning being very vivid and the thunder heavy; ropes seemed charged with electricity, sparking when touched with the fingers; rain heavy and the water came down the sides

¹ The proper explanation for this drop may be as follows: When the wind blows along the axis of a ravine, or along the valley of a river (as in the present case, where a south wind was blowing up the Hudson River valley) it goes faster over smooth water, or the center of the ravine, than over the land on either side, so that above the axis of the river there is a swift current of air, a lower pressure, and a lower temperature, all three directly due to the transformation of air pressure into air movement. The balloon fell because it suddenly came into a region where the atmospheric pressure was decidedly lower, and where by reason of the sudden expansion and cooling of its own gas the buoyancy of the balloon diminished.—C. A.

² Gases used in ballooning are usually at first saturated with moisture. This should be extracted either by drying or by condensation methods before going into the balloon, otherwise it condenses on the inside of the balloon as it rises and causes trouble to the aeronauts and their apparatus. Hydrogen and hydrocarbons are more buoyant when pure and dry than when moist.—C. A.

of the balloon and caught in the basket, causing throwing out of ballast. Storm continued until 5 o'clock in the morning. About 12 o'clock, hearing the sound of running water, balloon descended and landed in the top of a tree, staying there until 3 a. m., when a sudden gust of wind tore it loose. Dropped some ballast and rose and fell again suddenly, touching the ground. Balloon stayed about in the same place for one and one-half hours, going up and down alternately with the currents of air. Then it got out of this "pocket" in the mountains and ascended to 2438 meters. Ballast being low, descended near Butternut. Would have had to come down otherwise on account of extreme thirst and hunger. The water which rolled down the side of the balloon was unfit to drink, being tainted by the gas.

Omitting three hours in the tree, the rate of speed was 20.99 kilometers per hour. Statescope got wet and was erratic.

Monday, June 25, 1906.—Balloon "Sky Lark"; capacity, 510 cubic meters; hydrogen gas used; occupants, Leo Stevens, Maj. C. J. S. Miller, Charles Levee; ballast taken, 95.256 kilograms; ballast used, 86.18 kilograms; ascent at Franklin, Pa., 2:40 p. m.; descent at Woodhill, Pa., 5:10 p. m.; elapsed time, 2 hours and 30 minutes; distance, 49.89 kilometers; speed per hour, 19.95 kilometers; general direction, east; highest altitude, 5900 meters.

Balloon crossed the Allegheny River and French Creek.

Wednesday, July 11, 1906.—Balloon "Nirvana"; capacity, 1500 cubic meters; coal gas used; pilot and passenger, Dr. Julian P. Thomas, Roy Knabenshue; ascent at One hundred and thirty-eighth street, New York City, 4 p. m.; descent at Flatbush, Brooklyn, N. Y., 7:45 p. m.; elapsed time, 3 hours and 45 minutes; distance in kilometers, 17.70; speed per hour, 4.72 kilometers; general direction, south.

Experiments made with a barrel and rope in East River as a "sea anchor" at an elevation of about 250 feet. In passing over the city the crowd caught the guide rope and held the balloon, being very close to a hot chimney at the time, with the danger of igniting the gas.

Monday, July 16, 1906.—Balloon "Centaur"; capacity, 1200 cubic meters; coal gas used; pilot and passengers, Leo Stevens, James H. Hare, Charles Levee; ballast taken, 29.48 kilograms; all used; ascent at Clifton, Staten Island, N. Y., at 2:10 p. m.; descent made in Flushing Bay, Long Island Sound, opposite Classons Point, Long Island, N. Y., at 3:30 p. m.; elapsed time, 1 hour and 20 minutes; distance in kilometers, 24.14; speed per hour, 18.10 kilometers; general direction, northeast; highest altitude, 1188 meters.

Gas was very poor. Experimented with sea anchor of canvas in Flush-

ing Bay. Balloon collided with a house in leaving the ground, but no damage was done. After cutting free from the sea anchor the balloon rose a few feet and fell into the water alternately several times. The balloon descended at last upon a small sailing vessel and the occupants were helped out of the basket. Beyond some injuries to the envelope and the loss of a valuable photographic apparatus there was no serious damage done.

Tuesday, July 19, 1906.—Balloon "Nirvana"; capacity, 1500 cubic meters; coal gas used; pilot and passengers, Roy Knabenshue, Dr. Julian P. Thomas, Mrs. Thomas; ballast taken, 362.88 kilograms; ascent at One hundred and thirty-eighth street, New York City, 2:30 p. m.; descent at Woodcliff, N. J.; manner of landing, valve; distance, counting each leg of a zigzag course, 36.62 kilometers; general direction, southwest; highest altitude, 2743 meters.

A moving picture machine (kinetograph) was carried, weighing about 22.68 kilograms. Balloon traveled first southwest, then northeast, southwest again, northwest and west to landing place, having crossed East River twice and Hudson River once. Drag rope caught by crowd in One hundred and sixth street and balloon pulled to earth. Crowd let go later and balloon ascended. In crossing the Hudson the gas quickly cooled, bringing balloon down into the water. Threw out anchor and ascended. Anchor pulled out and balloon drifted over to the shore when the anchor was caught and descent made easily.

Saturday, July 23, 1906.—Balloon "America"; capacity, 400 cubic meters; coal gas used; pilot and passengers, Charles Walsh (?); ballast taken, 35 kilograms; ballast used, 20 kilograms; ascent at One hundred and thirty-eighth street, New York City, at 3:40 p. m.; descent at East Norwalk, Conn., at 5:45 p. m.; manner of landing, valve; elapsed time, 2 hours and 5 minutes; distance, 57.94 kilometers; speed per hour, 27.81 kilometers; general direction, northeast; highest altitude, 2000 meters.

Balloon left for the north, but, owing to expansion and reaching upper currents, it took an easterly direction. Condensation brought the balloon down above the Sound, taking the lower current, which was blowing north; crossed the Sound with the guide rope until nearing Stamford, Conn.; followed the shore until landing was made on the farm of C. F. Sherwood, East Norwalk, Conn.; used valve for landing and was brought to the ground by the people, who caught the guide rope; no damage whatever, and received all the assistance necessary; one hour from the time of landing was ready to ship back; beautiful ascension, but weather was misty. Total distance covered about 80 kilometers, making speed per hour about 40 kilometers.

FORECASTS AND WARNINGS.

By Prof. E. B. GARRIOTT, in charge of Forecast Division.

Atmospheric pressure was high over the British Isles until the third decade of the month, when the passage of an area of low barometer was attended by exceptionally heavy rain. In the vicinity of the Azores the barometer was high, except from the 1st to 4th and 14th to 20th, when slight barometric depressions covered that region.

In the middle and northern districts of the United States east of the Rocky Mountains and in the east Gulf and South Atlantic States there was an unusual prevalence of thunderstorms, and in many portions of these districts the rainfall was excessive. In the west Gulf States a period of drought was broken on the 25th.

The most notable barometric disturbance of the month in the region of observation appeared on the north Pacific coast of the United States on the 3d and advanced to North Dakota, where, on the morning of the 7th, the remarkably low reading of 28.68 inches was reported. On the 6th tornadoes occurred in eastern Minnesota and western Wisconsin. After the 7th this disturbance drifted slowly eastward, with diminishing intensity, and reached the Canadian Maritime Provinces on the 10th, attended on the 8th by severe local storms in Ontario. During the second decade of the month two disturbances advanced northward from the vicinity of western Cuba, attended by heavy rain in the Southeastern States.

Moderate temperature prevailed until the closing days of June, when a warm wave extended over the middle and northern districts east of the Rocky Mountains. In the first decade of the month and from the 21st to 25th frost occurred in the northern Rocky Mountain and Plateau districts, and on the 23d and 24th snow fell in Wyoming. From the 11th to 13th a frost-bearing cool wave advanced from the upper Mississippi Valley over the interior of New York and New England.

BOSTON FORECAST DISTRICT.

The weather of the month was fairly characteristic of the season. The precipitation, which was copious, resulted largely from showers and local storms, and was rather unevenly distributed. It was particularly heavy in the southwest portion of Maine, the southeast sections of New Hampshire, and extreme northern Vermont. In several instances heavy local rains were attended by hail and thunderstorms of marked severity. The temperature averaged slightly below normal and there were no marked extremes of temperature. There were no heavy gales along the coast, and the only delay or inconvenience to shipping resulted from fog. No storm warnings were displayed. Frost warnings were issued to cranberry growers on the 12th and were verified by light to moderate frosts.—J. W. Smith, District Forecaster.

NEW ORLEANS FORECAST DISTRICT.

Rainfall was generally deficient, and in some sections of the west Gulf States the month was exceptionally dry. No special warnings were issued and no storm occurred on the coast.—I. M. Cline, District Forecaster.

LOUISVILLE FORECAST DISTRICT.

The warm periods of the month were from the 6th to 10th and 27th to 30th, and the cool periods from the 11th to 15th and 19th to 21st. The rain periods of the month were from the 1st to 6th, 9th to 11th, and 13th to 26th. No special warnings were issued and no weather conditions occurred that would have justified them.—F. J. Walz, District Forecaster.

CHICAGO FORECAST DISTRICT.

While no unusually severe storms passed over the upper Lakes, warnings were issued on the 6-7th and 21st, the latter order being for western Lake Superior only. Special frost